

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD **WETLAND ENHANCEMENT**

(acre)
CODE NY659

DEFINITION

The modification or rehabilitation of an existing or degraded wetland, where specific functions and/or values are modified for the purpose of meeting specific project objectives. Some functions may remain unchanged while others may be degraded.

PURPOSE

To modify the hydrologic condition, hydrophytic plant communities, and/or other biological habitat components of a wetland for the purpose of favoring specific wetland functions or values. For example; managing site hydrology for waterfowl or amphibian use.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on any degraded or existing wetland where the objective is to specifically enhance a selected wetland function(s) and/or value(s).

Enhancement should not significantly change the primary wetland functions provided at the site.

Upon completion of the enhancement the site will meet the current NRCS soils, hydrology, and vegetation criteria of a wetland.

This practice does not apply to: a constructed wetland (656) intended to treat point and non-point sources of water pollution; wetland restoration (657)

intended to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to original conditions; or wetland creation (658) for creating a wetland on a site location which historically was not a wetland or on a site which was formerly a wetland but will be replaced with a wetland type not naturally occurring on the site.

CRITERIA

General Criteria

The landowner shall obtain necessary local, state, and federal permits that apply before wetland enhancement.

Water rights are assured prior to enhancement if required.

The design will not cause water to back up on neighboring land without an easement.

Document the soil, hydrology, and vegetative characteristics of the site and its contributing watershed before alteration.

The design shall incorporate physical features of the desired habitat, as required by the identified species of concern. For waterfowl, physical features shall be as described in NRCS Biological Technical Note "Wildlife Wetland Development".

The potential for occurrence of threatened or endangered species shall be evaluated for each site proposed for enhancement. Sites containing threatened or endangered species will not be enhanced under this standard unless it can be demonstrated

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

**NRCS, NHCP NY
September, 2002**

that the impact will benefit the species at risk.

The potential for the presence of cultural resources within the area of potential effects shall be evaluated for each site proposed for enhancement. Sites containing cultural resources will not be enhanced under this standard unless it can be demonstrated that the impact will not adversely affect the cultural resource. (See GM 420, Part 401)

If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as defined by local, state, or federal authorities. Sites containing hazardous waste will not be enhanced under this standard.

Criteria for Hydrology Enhancement

The hydrology of the site (defined as the rate and timing of inflow and outflow, source, duration, frequency, and depth of flooding, ponding or saturation) is modified to meet the project objectives. An adequate source of water must be available to meet designs for enhanced hydrology.

Embankments and low embankments are two methods of enhancing the hydrology of a site. Embankment structures shall be designed according to Pond Standard 378. Low embankments shall be designed according to Wetland Enhancement Standard NY659. Structures are considered low embankments if all of the following apply:

- the embankment does not cross a perennial stream
- the maximum height of fill, measured from the lowest point at the downstream toe of the embankment to the top surface of the fill along the centerline of

the embankment, does not exceed six (6) feet

- failure of embankment will not result in loss of life; in damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

The standards and specifications for Dike (356), Structure for Water Control (587), Pond (378) and Wetland Wildlife Habitat (644) will be used as appropriate. Refer to the Engineering Field Handbook, Chapters 13, "Wetland Restoration, Enhancement, and Creation," and 6, "Structures," for additional design information. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

Low Embankments

A. Low embankments meeting the following conditions will be built according to the criteria that follows:

- the watershed is 50 acres or less
AND
 - the drainage area average slope is less than 10%
1. The earth embankment crest or other conveyance will serve as a service spillway and shall be designed with a maximum velocity of 3 fps. or proven non-erosive velocity for the soil encountered to discharge a 10 year 24 hour storm frequency.
 2. The embankment top width will be a minimum of six (6) feet. No side slopes shall be steeper than 5 horizontal to 1 vertical.
 3. A core trench shall be provided under the embankment if more than two (2) feet of water is impounded.
 4. All vegetation and topsoil will be removed from the "footprint" of the

embankment. The design height of the embankment shall be increased by the amount needed to insure that after settlement, the actual height of the embankment equals or exceeds the design height. This increase shall be not less than 5 percent.

5. Seeding of the embankment shall be in accordance with NRCS Conservation Practice Standard 342, Critical Area Planting.

B. Low embankments meeting the following conditions will be built according to the criteria that follows:

- the watershed is greater than 50 acres
AND/OR
 - the drainage area average slope is 10% or greater
1. The embankment top width will be a minimum of six (6) feet. No side slopes shall be steeper than 3 horizontal to 1 vertical.
 2. A core trench shall be provided under the embankment if more than two (2) feet of water is impounded.
 3. A spillway system shall be provided. It can be a combination of pipe and vegetated earthen spillway, designed to discharge the runoff from a 25 year 24 hour storm. For drainage areas less than 100 acres the minimum pipe diameter will be 8 inches. For drainage areas equal to or greater than 100 acres the pipe will have a minimum diameter of 12 inches. Anti seep collars will be used if the conduit is smooth or is corrugated larger than 12 inches in diameter. Animal guards will be installed on all pipes less than 12 inches in diameter. The spillway system may also be a single erosion resistant spillway capable of handling the full design discharge.

4. Install antivortex devices, trash guards, and beaver protection on water control structures as appropriate.
5. The auxiliary spillway will be sized to carry the 25 year, 24 hour peak discharge. The spillway crest will be set 0.5 feet above the crest of the service spillway. No freeboard is required between the elevation of the peak discharge in the auxiliary spillway and the embankment crest if the downstream embankment slope is 5 horizontal to 1 vertical or flatter, otherwise, a freeboard of 0.5 feet is required between the elevation of the peak discharge and the top of embankment. The auxiliary spillway shall be designed to be stable.

For sites with favorable storage conditions, the 25 year peak discharge may be flood routed to reduce the size of the auxiliary spillway.

When the spillway is vegetated it will be located in natural, undisturbed soil. Rock lined spillways will have geotextile installed prior to placing the riprap.

If an undisturbed swale is to serve as the spillway, the capacity and velocity shall be checked.

6. All vegetation and topsoil will be removed from the "footprint" of the embankment. The design height of the embankment shall be increased by the amount needed to insure that after settlement, the actual height of the embankment equals or exceeds the design height. This increase shall be not less than 5 percent.
6. Seeding of the embankment shall be in accordance with NRCS Conservation Practice Standard 342, Critical Area Planting.

Criteria for Wetland Functions

In New York, a functional assessment shall be performed on the site using procedures as contained in the National Food Security Act Manual prior to enhancement.

Project goals and objectives shall minimize adverse impacts to wetland functions not specifically targeted for enhancement.

Where possible, wetland functions not targeted for enhancement should also be maximized.

CONSIDERATIONS

Consider existing wetland functions and/or values that may be adversely impacted.

Consider Standard 644, Wetland Wildlife Habitat Management, when the planned purpose or secondary objectives of the wetland enhancement is for wildlife functions and values.

Consider Standard NY744, Pothole, and Biological Reference 20, A Guide to Pothole Construction, when diversifying a site for wildlife functions and values.

Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.

Consider stripping and stockpiling topsoil, then replacing over disturbed areas and shallow areas for a source of native seeds and seeding establishment.

Consider the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

Consider effects on downstream flows or aquifers that would affect other water uses or users.

Consider installing a water control structure in all low embankments when management for wildlife functions and values is the planned purpose.

Consider effects on wetlands water-related resources, and wildlife habitats that would be associated with the practice.

Consider linking wetlands by corridors wherever appropriate to enhance the wetland's use and colonization by the flora and fauna.

Consider establishing vegetative buffers on surrounding uplands to reduce sediment and soluble and sediment-attached substance carried by runoff and/or wind.

The nutrient and pesticide tolerance of the species planned should be considered where known nutrient and pesticide contamination exists.

Consider cleaning all equipment before entering and leaving a construction site for control of invasive species.

Consider an aggressive temporary vegetative cover to suppress the establishment of invasive species.

Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation.

Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life, and as a minimum will be included in the O&M plan. They include normal repetitive activities in the application and use of the

practice (operation), and repair and upkeep of the practice (maintenance):

Determine that any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals shall not compromise the intended wetland function and purpose;

Where available and feasible, use biological control of undesirable plant species and pests (e.g., using predator or parasitic species).

Based on plan objectives, determine and set timing and level setting of water control structures for the establishment of desired hydrologic conditions, for management of vegetation and for optimum wildlife use.

Develop and carry out inspection schedule for embankments and structures for damage assessment;

Evaluate the effect of sediment accumulation to determine frequency of sediment removal. Actions to be taken will be based on the effect of sedimentation on the planned biological functions and values of the wetland.

Determine and carry out management needed to maintain vegetation, including control of unwanted vegetation, and exclusion of livestock.

Determine compatible uses that will be managed to enhance, restore, create and protect the specific planned wetland functions and values.

REFERENCES

A Guide To Pothole Construction, USDA NRCS, NY, 11/15/01

USDA NRCS Engineering Field Handbook, Chapter 13

Middleton, B. Wetland Restoration, Flood Pulsing and Disturbance Dynamics. John Wiley & Sons, Inc., 388 pp.

NY NRCS Biological Technical Note, Wildlife Wetland Development